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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference ---	FOR FURTHER ACTION	
	See Form PCT/IPEA/416	
International application No. PCT/CR 02/00004	International filing date (day/month/year) 06.06.2002	Priority date (day/month/year) 06.06.2002

International Patent Classification (IPC) or national classification and IPC
A01M7/00Applicant
TALLERES INDUSTIRALES HIVA S.A. et al.

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
 - a. (*sent to the applicant and to the International Bureau*) a total of 10 sheets, as follows:
 - sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - b. (*sent to the International Bureau only*) a total of (indicate type and number of electronic carrier(s)), containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

Date of submission of the demand 06.08.2003	Date of completion of this report 07.10.2004
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**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/CR 02/00004

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
 - This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
 - international search (under Rules 12.3 and 23.1(b))
 - publication of the international application (under Rule 12.4)
 - international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

Description, Pages

1-7 filed with telefax on 11.08.2004

Claims, Numbers

1-5 filed with telefax on 11.08.2004

Drawings, Sheets

1/7-7/7 filed with telefax on 18.03.2004

- a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. The amendments have resulted in the cancellation of:
 - the description, pages
 - the claims, Nos.
 - the drawings, sheets/figs
 - the sequence listing (*specify*):
 - any table(s) related to sequence listing (*specify*):
4. This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
 - the description, pages
 - the claims, Nos.
 - the drawings, sheets/figs
 - the sequence listing (*specify*):
 - any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/CR 02/00004

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-5
	No: Claims	
Inventive step (IS)	Yes: Claims	1-5
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-5
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

**INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(SEPARATE SHEET)**

International application No.

PCT/CR 02/00004

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial
applicability; citations and explanations supporting such statement**

The present application seems to satisfy the criterion set forth in Article 33(2) respectively Article 33(3) PCT because the subject-matter of Claims 1 - 5 seems to be new respectively inventive in respect of prior art as defined in the regulations (Rule 64(1)-(3) respectively Rule 65(1)(2) PCT).

As next prior art cited in the application is regarded US-A-5967383 which also relates to a container and coupler assembly for transferring granulated materials according to the preamble of claim 1, i.e. US-A-5967383 discloses a transferring system of granulated material from a first container to a second container, through a regulating valve attached to the first container and that couples to a collar that is attached to the second container. It is an object of the claimed system transferring granulated materials toward another container resp. to transfer granulated toxic agrochemical materials without spillage or contact with the worker. The invention has provided an arrangement to hang the spherical container straight up or in an inverted position so that the container can be transported via cable.

1

CONTAINER AND COUPLER ASSEMBLY FOR TRANSFERRING GRANULATED MATERIALS AND OTHERS

Technical Field:

This invention is to be applied in the field of Industrial Agriculture

Background and Previous Technical Status:

This invention has been created and developed taking into account some aspects of other previous patented inventions by the same inventor. Such patents are the following:

Costa Rican patent #2519, from 1995; named Coupling System between Pump and Box to Load and Unload Granulated Agrochemicals and Others, invented by Edgar Hidalgo Vargas. This invention is a valve system formed by two concentric cylindrical pieces and a third piece is a collar. The valve is attached to a container, and the collar is attached to another container. The container with the collar uses the collar to receive and secure the valve, coupling both containers, and the material can be transferred from one container to the other. The collar is a key part of this invention, and it is essential to the invention of the closed system application to transfer granulated agrochemicals from one container to another by gravity.

Costa Rican patent #2552, from 1997; named Improvements to the patent #2519, also invented by Edgar Hidalgo Vargas. This patent comprises several improvements made to Costa Rican patent #2519, and that basically consisted of adding a self-locking mechanism to the valve, several gaskets to make the systems hermetic and waterproof, a cover to protect the valve, and several minor design modifications to improve performance.

Costa Rican patent as Utility Model # MU115, from 1997; named Container to Transfer, Transport, and Store Granulated Agrochemicals and Others, invented by Edgar Hidalgo Vargas. This container is used with the systems of Costa Rican patents #2519 and #2552, and it is used to store, transport, and transfer granulated agrochemical materials and others. This container was ergonomically designed to ease manipulation; besides, the container is hermetic and waterproof.

USA patent #5967383, from 1998; Container and Coupler Assembly for Transferring Granulated Material, invented by Edgar Hidalgo Vargas.

Patent US6305444 presents a closed system to transfer granulated material by gravity from one container, through a rotational valve that aligns openings for the material to pass

through toward another container. The system of the patent US6305444 is similar to the system of patent US5967383 and they operate in similar ways.

The previous art to our invention "Container and Coupler Assembly for Transferring Granulated Materials and Others" is mainly determined by the knowledge presented in patent 5 US5967383 and, in a less important way, in patent US6305444.

Patent US5967383 is characterized by a transferring system of granulated material from a first container to a second container, through a regulating valve attached to the first container and that couples to a collar that is attached to the second container. It is important to notice that in banana plantations the second container is the tank of a pump used to dispense toxic 10 granulated material. The system of patent US6305444 has very similar characteristics, works in a similar way, and has similar applications to the system of patent US5967383. The operation of the two systems in patent US5967383 and patent US6305444 of the previous art, is performed the same way for both by lifting the first container and turning it upside down to couple the valve that is attached to the first container to the collar attached to the second 15 container and, later, performing a relative rotation between both containers to open the valve and allow the granulated material to be transferred from the first container to the second container. The regulating valve of the patent US5967383 is attached to the first container and has characteristics and elements to make the container hermetic. In both patents considered in the previous art, patents US5967383 and US6305444, a collar is located and attached to 20 the second container to couple the regulating valve and transfer the material from the first container to the second container.

Disclosure of the Invention:

This invention is a hanging system to transfer granulated materials or other similar materials toward another container. This new system is to transfer granulated toxic 25 agrochemical materials or other material without spillage or contact of the material with the worker. The system consists of a spherical container, a nozzle, a hose or flexible duct, a regulating valve to regulate the material flow, a cap, and another container. Different from the previous state of the art, which are the patent USA #5967383, and Costa Rican patents #2519, #2552, and # MU115, this new invention has provisions to hang the spherical 30 container, straight up or in inverted position, so that the container can be transported via cable, like in the banana plantations. Besides, the new system makes use of the valve of Costa Rican patents #2519 and #2552, and USA patent #5967383, in an ingenious new way,

locating the valve at the end of a flexible duct, which at the same time is connected to the spherical container. Hence, while the spherical container is hanging, it is inverted to transfer its contents to other containers by gravity. Another novelty of this invention is the new configuration of the fundamental part, the collar of patents #2519, #2552, and USA #5967383, forming a single piece with the cap of the container toward which the material is being transferred. With the new configuration, the cap and the collar are not two separated pieces anymore; instead, the job of both pieces is now performed by a single part, which is a new cap with a centered collar. This way, the pumps used to apply granulated material in the banana plantations do not have to be modified at all; instead, the old caps are changed for the new ones and the pumps are ready to be refilled with the hermetic and waterproof system of this invention. Another novelty of the invention is the spherical container that is used to store, transport, and transfer to other containers. This task is performed with the spherical container in a compact, safe, hermetic way, and the spherical container is easy to manipulation. Other novelties of the invention are the shape and features to hang the spherical container that is used to store, transport, and transfer material to other containers. These tasks are performed with the spherical container in an compact, safe, hermetic way, and the spherical container is easy to manipulate. The spherical container presents a newly designed base with openings to hang it upside down to transfer material by gravity without the need of lifting the container. Tabs with opening are also on the superior wall of the spherical container to hang it in the normal position.

Detailed Description of the Drawings:

This invention is a container and coupler assembly for transferring granulated materials and others as presented in figure 1. The system shown in figure 1 is a spherical container (1), a nozzle (2), a hose or flexible duct (3), a regulating valve to adjust the material flow (4), a cap with a collar or receiver opening (5), and a container (6). This system is used to transfer toxic granulated agrochemicals or other materials, without risk of contact of the material with a user.

The spherical container (1) main purpose is to store, transport, and transfer its content into other containers. The spherical container is compact, safe, hermetic, waterproof, and easy to manipulate. Accessories with specific functions have been added to the container (1) so that the material could be efficiently transferred, stored, and transported. As shown in figure 2, the container has two mushroom-shaped handles (11) (only one of the handles is shown in the

figure), located at the center of concave sections (40). Concave sections (40) were created to accommodate handle members (11), and to allow free space for the worker's hands to move while holding or lifting the container. Handles (11) are located in positions diagonally opposed from one another, and at the center part of the container (1). The spherical container

5 (1) has a treaded neck (9), used to hermetically couple a nozzle (2) or at transferring valve (36) to the container, while using a gasket (8). The container's bottom presents a circular section (14), which works as a base or support to stack up the container one on top of another, as shown in figure 5. When the containers are stacked up one on top of another, bottom section (14), of the container that is on top, is supported on the section (27) of the container
10 that is underneath. The bottom of the container (1) has two vertical sections, (41) and (44), and two horizontal sections, (42) and (43), which have similar shape to the surface of cover (15) of nozzle (2) or valve (36). The containers' bottom is designed so that they can be stacked up one on top of the other when either the nozzles (2) or valves (36) are connected to them. To protect the material that is inside the container, a plug (50) is inserted in the hole
15 (49) of nozzle (2), and a cover (15) is snugly placed on the nozzle (2), or valve (36), and it is held there by means of an o-ring gasket (16), which make the container hermetic and waterproof. Nozzle (2) is shown in detailed in figure 6. O-ring (16) is installed inside a circular slot (45), around the nozzle (2) or valve (36), as shown in figure 6. In addition, nozzle (2) has some openings (10) to place security seals to keep the container closed. Those

20 security seals are placed through openings (10) and openings (47) on the cover (15), and also through openings (48) which are on the top part of the spherical container (1). The container (1) also has some openings (13) to hang it in an inverted way to dispense material by gravity. The container (1) has eyed tabs (17), used to hang the container in non-inverted position and transport it via cable, like in the banana plantations.

25 As shown in figures 1 and 2, nozzle (2) is coupled to the container (1), and such nozzle has an inclined surface (7) to ease dispensing the material. As shown in figure 1, nozzle (2) is connected to a hose or flexible duct (3), and the other end of the hose is connected to a regulating valve (4). Regulating valve (4) consists of two pieces (4a) and (4b) as shown in detail in figure 4. When piece (4a) is inserted inside piece (4b) until cylinder (35) gets inside
30 the opening (39), pins are inserted inside the openings (46) centered in the protuberances (34), to hold pieces (4a) and (4b) together. The pins are inserted through the holes (46), located at the center of the protuberances (34), and inside slots (38) of piece (4a). These pins

hold pieces (4a) and (4b) together and allow only relative rotation of one piece with respect to the other in order to make the holes (31) and (33) coincide. In case that the protuberances (34) are removed, the pins are still placed through holes (46) in the vertical wall of piece (4b), and in the slots (38) of piece (4a). A spring is used to hold the valve (4) in its closed position, avoiding transferring material unless an external force opens the valve on purpose. The spring is placed around cylinder (35), and one of its ends is supported on a slot centered along cylinder (35). The other end of the spring is fixed to protuberance (37). The user can activate the valve (4), to let the material pass through, by holding with one hand the piece (4a) at section 28, and forcing a relative rotation of (4b) with respect to (4a) with the other hand, grabbing (4b) at rough section (29). Once the user releases the parts (4a) and (4b) the valve closes due to the action of the spring, avoiding accidental material spillage. To transfer material, the valve (4) is inserted in the opening (26) in cap (5) as far as the border (30) hits the cap's superior surface. To perform this coupling, the protuberances (34) slide on the L-shaped slots (22) in cap (5). Protuberances (34), of valve (4), slide on the L-shaped slots (22), keeping the valve attached to the cap while the material is being transferred, and preventing spillage. The system also works without protuberances (34), and in this case the L-shaped slots (22) are not needed. Also, in this latter case, the user must keep valve (4) in contact with cap (5) while material is being transferred.

Cap (5) has different configurations, as shown in figure 3. Cap (5A) has flat superior wall (21) with centered hole (26). Cap (5B) has convex superior wall (18) and centered hole (26). On the other hand, each cap (5C) and (5D) has concave superior walls (23). Cap (5C) has eccentric hole (26), but cap (5D) has centered hole (26). Caps (5C) and (5D) have handle. The handle (24) of cap (5C) is one solid arc, but the handle of cap (5D) consists of two extended pieces that form a discontinuous arc, as shown in figure 3. Caps (5) have a hole (26), with or without L-shaped slots (22), and vertical section (25) with internal thread. Also, caps (5) have plugs (20) to cover the hole (26) and seal the container (6). When valve (4) has protuberances (34), the opening (26), in cap (5), is extended with cylindrical shape below the cap's superior wall and on the walls of opening (26) there must be L-shaped slots (22). In case that valve (4) does not have protuberances (34), cap (5) does not need to have L-shaped slots (22), and the opening (26) does not have to be extended below the cap's superior wall.

The system is bi-directional and can be used to collect the material leftover that is inside the containers (6), and that is required to be transferred to store and transport in container (1).

In summary, this invention consists of a system that transfer material from a container (1), through a nozzle (2), a flexible duct or hose (3), a valve (4), and a cap (5), into a second container (6). The valve (4) is coupled to cap (5) to allow transferring material without spillage and without contact of the user with the material. Besides, the containers are hermetic and waterproof.

Mode of Operation of the Invention:

The container and coupler assembly for transferring granulated materials and others has a spherical container (1), another container (6), and a coupling system (2), (3), (4) and (5) between the containers. The coupling system is flexible and has a valve to regulate the material flow between the containers as shown in figures 1 and 7. The spherical container (1) is used to store, transport and transfer material to other containers. Container (1) could be hanged up-side down to dispense material by gravity, or could also be hanged upward to be transported via cable, like in the banana plantations. As shown in figures 1 and 2, container (1) is coupled to a nozzle (2), and the latter is connected to one end of the flexible duct (3). The other end of flexible duct (3) is connected to a regulating valve (4), made up by two parts (4a) and (4b) that can rotate one with respect to the other to allow or block the material flow. A spring is used to always keep parts (4a) and (4b) in the closed position.

To transfer the material from container (1) to container (6), the regulating valve (4) is inserted in the opening (26) on the cap (5) as far as the border (30) hits the cap's superior surface. To perform this coupling, protuberances (34) slide on the L-shaped slots (22) in cap (5). The L-shaped slots (22) allow protuberances (34) of valve (4) to enter and slide on to keep the valve fixed to the cap while the material is being transferred, avoiding containers separation and material spillage. The operator can activate the valve by grabbing part (4a), on section (28), with one hand, and with the other hand grabbing part (4b) on section (29), and forcing a relative rotation of the two parts to allow material flow. Once the operator releases parts (4a) and (4b), the valve closes automatically because of the spring's force. The system also works without protuberances (34), and in such case the operator must keep valve (4) pressed against cap (5) while opening the valve, so that the material is safely transferred.

Operation of the system could be done without the container (1) being hanging; however, the container (1) must be lifted in an inverted way by an operator and another operator must couple and open valve (4) to transfer the material to container (6). The mushroom-shaped handles make it easier for the operator to lift and invert container (1).

Even though the operation mode of the system is much more frequent and intense to transfer material from containers (1) toward containers (6), the system is bi-directional, and containers (1) could be used to collect leftovers that are in containers (6), to store and transport the material in a safe and efficient way. The bi-directional operation of the system is important at the end of a work period, when leftover material is still in containers (6). To transfer material from container (6) toward container (1), valve (4) must be fixed directly to container (1), and container (1) is inverted and coupled to container (6), and both containers coupled together are inverted such that container (6) is above container (1). After that, container (6) is rotated to open the valve and transfer the material toward container (1).

5 10 Another procedure to transfer material from container (6) to container (1) is by placing both containers on the ground, one next to the other, and connecting both with the flexible duct (3), by coupling the regulating valve (4) to cap (5), which at the same time is coupled to container (6). Later, valve (4) is activated, and container (6) is lifted and inverted to transfer the material toward container (1). In the bi-directional operating mode, it is important that

15 15 valve (4) have protuberances (34), in order for the coupling of valve (4) and cap (5) to be safe and avoid spillage. The later procedure requires that while one operator lifts the container (6), another operator couples and opens the valve (4).

CLAIMS:

1. A container and coupler assembly for transferring granulated materials and others characterized by:
 - (a) a first container (1) with spherical shape and with openings (13) to hang it, with a nozzle (2) with threaded base hermetically coupled to the neck of said first container, the output end of said nozzle attached to a first end of a flexible hose (3), the second end of said flexible hose connected to the base of a regulating valve (4), the other end of the regulating valve couples to the opening (26) of a cap (5) attached to a second container (6);
 - (b) a nozzle (2) with plug (50), gasket (8), o-ring gasket (16) and cover (15) that seal said spherical container and make it hermetic to protect its content during transportation and storage, and to protect the environment and people that handle the containers when the content is toxic material; said nozzle (2) with an inclined section (7) to completely evacuate the material by gravity when the spherical container is hung in an inverted position;
 - (c) a double purpose cap (5) attached to said second container, the first of said purposes is to couple to the regulating valve (4) to join said first container with said second container to transfer material between them, the second of said purposes is to keep said second container hermetically sealed; said cap (5) with plug (20) inserted in the opening (26) to seal said second container;
 - (d) a regulating valve (4) with a cylindrical end (28) to be attached to flexible hose (3) and with the other end to be coupled to said cap (5) by means of protuberances (34) that penetrate and slide on L-shaped slots (22) to allow transferring material when the regulating valve is open;
 - (e) a first container (1) with spherical shape and openings (13) at its base (14) as means to hang said first container upside down from rolling elements that travel along an elevated cable like in banana plantations, and to hold said first container hanging on the elevated cable to transfer material by gravity through the transferring system (2,3,4,5) toward said second containers; said first container with openings (17) as means to hang it in normal position.
2. The container and coupler assembly for transferring granulated materials and others of claim 1 characterized by having a nozzle to dispense material from inside said first container towards said second container, and to receive material in the other direction; said nozzle with base internally threaded to couple it to said first container; said nozzle with a plug and a cover to protect the material inside said first container; said nozzle with a gasket seat to place

said gasket (8) between said nozzle and said first container to make the container hermetic; said nozzle with groove (45) to house O-ring gasket (16); said O-ring gasket makes hermetic contact with said nozzle and said cover; said nozzle and cover with tabs with openings (47 and 10) to place security seals.

5. 3. The container and coupler assembly for transferring granulated materials and others of claim 1 characterized by a regulating valve (4) to control material flow; said regulating valve with two concentric cylindrical-shaped parts placed one inside the other, and with pins and slots to hold them together; said pins inserted inside openings in the wall of the external cylindrical-shaped part, and one end of said pins penetrate inside said slots in the wall of the 10 internal cylindrical-shaped part; said cylindrical-shaped parts rotate only with respect to each other; said cylindrical-shaped parts with semicircular openings in both pieces to open or close said regulating valve; said regulating valve with a spring to keep it closed unless it is forced to be open; said regulating valve with or without protuberances (34); said protuberances with concentric holes to insert said pins; said protuberances to slide on L-shaped slots located in a 15 cylindrical wall of said superior opening of said cap; said regulating valve with an end (28) to couple to said second end of said flexible hose, and with a rough edge (29) to grab and activate the regulating valve; said regulating valve with a step (30) to limit the penetration of the valve in said superior opening (26) of said cap.

4. The container and coupler assembly for transferring granulated materials and others of 20 claim 1 characterized by having a cap (5); said cap internally threaded on its base to couple to said second container; said cap with superior central or eccentric opening; said superior central or eccentric opening with or without a downward cylindrical wall extended from the superior wall of said cap; said cylindrical wall with or without said L-shaped slots; said cap with or without handle; said handle formed by one or two arched sections; said cap with 25 concave, flat, or convex superior wall; said cap with plug to hermetically seal said superior central or eccentric opening.

5. The container and coupler assembly for transferring granulated materials and others of claim 1 characterized by a first spherical container (1) with openings in the base and in the superior tabs to hang said first container in an upside down or normal position, respectively; said first container with mushroom-shaped handles, and cooperative bottom to stack up 30 identical containers one on top of the other; said first container with a neck externally threaded to connect said nozzle (2); said spherical container with tabs with opening placed

near its neck to put security seals between said first container and said nozzle and between said first container and said cover.

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